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U. S. Department of Agriculture.

THE AGRICULTURAL STUDENT



A MONTHLY MAGAZINE DEVOTED TO AGRICULTURAL EDUCATION.

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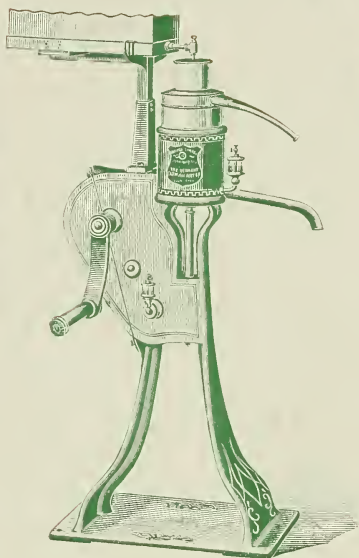
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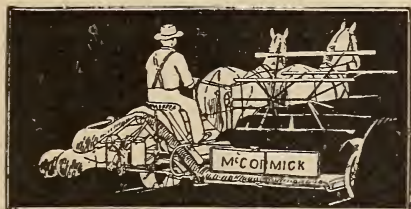
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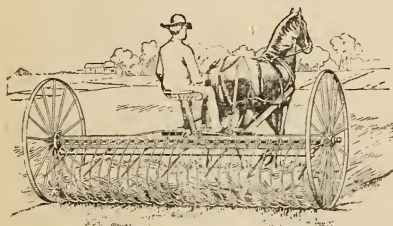
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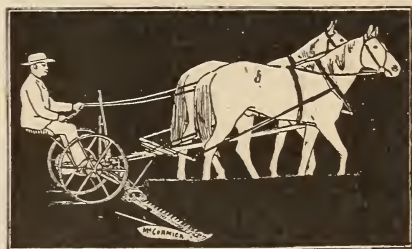
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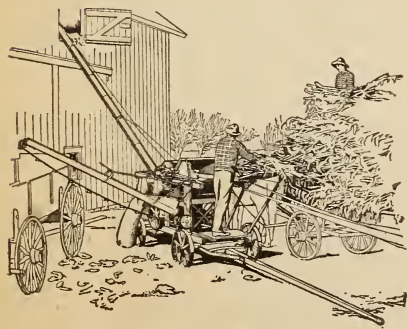
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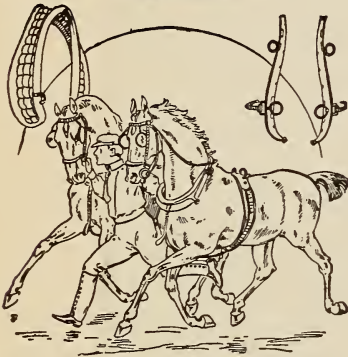
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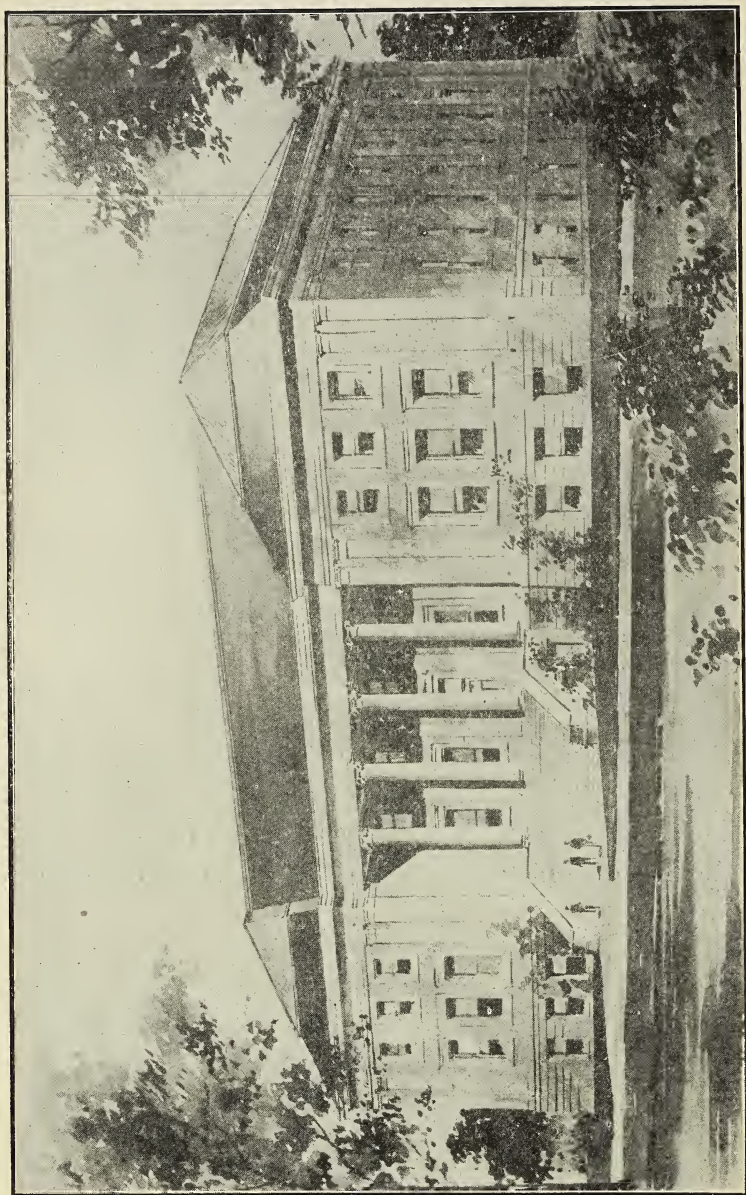
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THE AGRICULTURAL STUDENT.

VOL. VIII.

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No. 1.

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EDITORIAL CHAT.



CONTENTS.

Editorial Chat	1
Agricultural College News.....	4
Miss Minnie A. Stoner	5
Student Judging Contests	5
Metals for Students' Live Stock Reports	6
International Live Stock Expo- sition	7
The Opportunity in Agriculture.	9



The payroll of the Department of Agriculture of the Ohio State University, Columbus, for the past year was \$5,013.47, of which \$3,893.05 were paid to students. During the year 73 students worked upon the farm and campus and earned amounts varying from 37 cents to \$316.39. Three students earned over \$300, 16 earned amounts varying from \$100 to \$300, 9 earned between \$50 and \$100 each, while 48 earned less than \$50.

Those who earned \$300 or more worked during vacation, while many of those who earned small amounts found employment, also, in other departments or with firms or private families in the city. The student who earned but 37 cents with the Department of Agriculture was, nevertheless, an agricultural student who depended entirely upon his own efforts for support.

Sometimes students expect to do too much. The average young man can not ordinarily do much more than earn his living when he has nothing else to do. Probably a student can, if he has the opportunity, earn \$100 during the school year with as good effect upon his health and his studies as playing foot-ball, basket-ball or base-ball, but to earn a living and at the same time carry the work of

a college course planned to occupy a student's full time is more than most students can accomplish. Some students do this in every college, but, as a rule, students who attempt self-support should expect to lengthen their term of study.

The list of Alumni and ex-students in the new catalogue of the College of Agriculture and Domestic Science of the Ohio State University shows that of the three hundred ex-students of that college during the past ten years who have settled occupations, over eighty per cent. are engaged in agricultural pursuits. During the past year, seven graduates of the College of Agriculture have been appointed to positions in the United States Department of Agriculture, while three have been appointed to important college positions. Iowa, Illinois, Indiana and Oklahoma have received accessions to their teaching force from the graduates of its course in Agriculture, while five members of the instructional force of the New Hampshire State College have degrees from the O. S. U.

The occupation of the graduates for the past five years of this college is set forth in a leaflet, which may be obtained by addressing the college at Columbus.

We wish to call the attention of our readers to the article, "The Opportunity in Agriculture," by Professor Hunt. It is full of facts and reason from beginning to end and will prove interesting to all who take time to think of the future of the country whether interested in agriculture directly or not.

Agricultural College News.

Dairy Husbandry has been made a distinct chair in the Kansas State College, and Prof. D. H. Otis has been promoted to this important position. The independent department in both college and station will be rapidly developed.

Prof. C. H. Eckles has been elected to the chair of Dairy Husbandry in the Missouri Agricultural College with the rank of Assistant Professor.

N. O. Booth has resigned his position as Horticulturist in the University of Missouri to accept a similar position in the New York Agricultural Experiment Station at Geneva.

The University of California is to establish a Dairy School during the coming year, with W. E. Griffith, of the Dairy Department at Washington, in charge.

Mr. H. Hasselbring, of the New York Experiment Station, has been appointed Assistant in the Agricultural Experiment Station at the University of Illinois.

Professor Charles W. Burkett, professor of Agriculture in the New Hampshire State College, has been elected to a similar position in the University of North Carolina. Mr. Burkett graduated from the Ohio State University in '95, and was immediately elected assistant in Agriculture at the same place. After serving two years in this capacity, he was elected Associate Professor of Agriculture in the New Hampshire College of Agriculture, and one year later was made Head of the Department and given the rank of Professor. Mr. Burkett, although a young man, has made a name for himself as an agricultural teacher, a Farmers' Institute worker, and an agricultural writer, and the University of North Carolina is to be congratulated on securing a man of such known ability to lead in Agricultural Education in that state.

Knot. C. Egbert, who graduated from the Agricultural College of O. S. U. in 1890, and from Cornell University last June, with a second degree, has been appointed Superintendent of Indian Schools on the Santee Reservation, Nebraska.

M. F. Miller, B. S. (Agr.), Ohio State University '00, and M. S. A., Cornell

University '01, is Field Assistant with the Division of Soils, United States Department of Agriculture, and stationed in Tennessee.

C. N. Mooney is Field Assistant with the Division of Soils, United States Department of Agriculture, and stationed in Virginia.

E. O. Fippin, '00, is now in charge of Field Work, Division of Soils, United States Department of Agriculture, and at present stationed in Michigan.

F. W. Taylor, '00, is now Field Assistant in the Division of Soils, United States Department of Agriculture, and at present stationed in New Jersey.

A. G. McCall, '00, is Field Assistant in the Division of Soils, United States Department of Agriculture, and is stationed at Washington.

Marion Imes, Assistant in Dairying and Veterinary Medicine at New Hampshire State College, has been appointed City Anti Post-mortem Inspector at the Union Stock Yards, Chicago.

Fred S. Johnston has been appointed Associate Professor of Agriculture at Purdue University. Professor Johnston graduated from the Ohio State University from the course in Agriculture in 1899. He was immediately appointed Assistant in Agriculture, and later Assistant Professor of Agriculture at the New Hampshire State College, which position he resigns to accept the present appointment. He has proven to be a very successful teacher. Professors Latta and Purdue University are to be congratulated upon securing a man so well trained for this important position. He enters upon his new duties September 1, and his time will largely be devoted to University work in Agronomy and Farm Engineering.

Miss Minnie A. Stoner,

THE NEW PROFESSOR OF DOMESTIC SCIENCE.

Miss Minnie A. Stoner, Dean of the Woman's Department and Professor of Domestic Science in the Kansas State Agricultural College, has been elected Professor of Domestic Science in the Ohio State University.

Professor Stoner's preparation consists of six years of collegiate training and eight years as a teacher. Her collegiate training includes a four-year course in Domestic Science and a year's professional normal course in Dakota, and a year's course in the Boston Normal School of Household Arts. To this she has added a year's advanced work in both Psychology and Chemistry.

Her experience as a teacher comprehends works in both Domestic Science and Domestic Art in high school, manual training school, college, and university. During the past three years she has been at the Kansas State Agricultural College, where she has had a very successful career. She is spoken of as a woman of unusual ability as an organizer, of pleasing and commanding personality, and an excellent teacher. She has been further characterized as one who "will always surpass expectation and never disappoint the highest confidence or fail in the greatest demand upon ability, power, and efficiency."

Student Judging Contests.

One of the new and striking features connected with the live stock exhibit of the Ohio Exposition this year was the student judging contests. In all twenty-six students of agriculture at the university participated in the contest arranged by the college officials and the prominent breeders of the state.

Owing to the large number of papers to look over the judges are unable to announce the results at present.

A fuller account of the contest and the results will be given in the October STUDENT.

The following is a list of contributors of prizes:

DRAFT AND COACH HORSES.

McLaughlin Bros., Columbus, O.,
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French Coach Horses\$50 00

BEEF CATTLE.

J. M. Steward & Son, Canal Winchester, breeders of Shorthorn Cattle\$20 00

W. R. Cofman, Canal Winchester, Ohio, breeder of Aberdeen Angus Cattle 5 00

J. A. Gerlaugh, Harshman, O., breeder of Shorthorn Cattle... 5 00

A. H. Jones, Delaware, O., breeder of Shorthorn Cattle..... 5 00

D. A. Teener, Cumberland, O., breeder of Cattle..... 5 00

A. W. Jones, Youngstown, O., breeder of Shorthorn Cattle.... 5 00

W. I. Wood, Williamsport, O., breeder of Shorthorn Cattle.. 5 00

Total for Beef Cattle.....\$50 00

DAIRY CATTLE.

W. B. Smith & Son, Columbus, O., breeders of Holstein-Friesian Cattle\$25 00

H. B. VanCleve, Mentor, O., breeder of Holstein-Friesian Cattle 20 00

F. G. Johnson, Columbus, O., breeder of Holstein-Friesian Cattle 5 00

Total for Dairy Cattle\$50 00

SHEEP.

Dwight Lincoln, Milford Center, O., breeder of Rambouillette..\$10 00

Ruhlen Stock Farms, Plain City, O., breeder of Shropshire Sheep 5 00

Shaw & Son, Newark, O., breeder of Southdown Sheep 5 00

Wing Bros., Woodland Farm, Mechanicsburg, O., breeders of Dorset Sheep 5 00

Total for Sheep\$25 00

SWINE.

J. M. Klever, Bloomingburg, O., breeder of Poland-China Swine.\$10 00

J. M. Willis, Bloomingburg, O., breeder of Berkshire Swine.... 10 00

Total for Swine\$20 00

Grand total\$195 00

Medals for Students' Live Stock Reports.

The Zenner Disinfectant Co., Detroit, Mich., announces its offer of silver and gold medals at each State fair and at the International Live-Stock Exposition at Chicago, Ill., November 30th to December 6th, for the best report of the stock exhibit written by students or recent graduates of agricultural colleges. These medals will be struck from the same die and will be of pleasing design; the silver medals will be offered at the State fairs and the gold medal at the great Chicago show. Notice of the offer of these trophies has been communicated to the agricultural colleges by Prof. C. F. Curtiss, Director of Iowa Agricultural College, in the following letter:

"I am authorized by the Zenner Disinfectant Co., Detroit, Mich., to announce that that company will offer a silver medal at each State fair and a gold medal at the International Exposition at Chicago in December for the best report of some feature or part of the stock exhibit by students or graduates of the various agricultural colleges. It is the wish of the company that there be not less than five representatives in each State contest. The medals will be appropriate and will constitute valuable trophies.

"I am gratified to announce this generous provision for these contests, and I am sure that it will afford another means of stimulating interest in the animal husbandry work of our colleges and at the same time give to the young men engag-

ing the work a most valuable training. The student who, in addition to seeing and accurately measuring animal excellence, can put his mental concepts clearly and logically into writing, will be greatly strengthened thereby."

How those agricultural college students are laying claim on public attention! The makers of Zenoleum appreciate the great importance of such education and desire to encourage and stimulate the students in their work. This newest offer is unique but happy in its conception. Writing makes an accurate man. Knowledge is power only when it can be put to use. Training in the work of putting clearly on paper the impressions gathered at a show and the strong and weak points of the prize winners will stand the student well in hand in all his future work whether in college or on the farm. The Zenner Disinfectant Company is to be congratulated on the happy thought which leads it to institute such important competitions and provide rewards of merit for the winners.

CONDITIONS GOVERNING THE ZENOLEUM MEDAL CONTEST.

1. There must be at least five entries in each state to complete a class and make its college eligible to such competition.

2. The competition will be open to all bona-fide students of the state agricultural colleges and to those who have graduated within two years from date of contest.

3. The contest shall be based upon a report of not less than 1,500 and not more than 2,000 words describing the exhibits and discussing the awards in not less than three and not more than five of the following rings:

Dairy Cattle—Aged cow ring of Jersey, Holstein, or Guernsey breeds.

Beef Cattle—The two-year-old heifer ring of Hereford, Shorthorn or Aberdeen-Angus breeds.

Horses—The three-year-old stallion ring of the Clydesdale, Percheron or Shire breeds.

Sheep—The yearling ewes ring of any of the leading down, fine-wool or long-wool breeds.

Swine—The yearling boar ring of the Poland China, Berkshire, Duroc Jersey or Chester White breeds.

In case five rings are reported, not more than two shall be selected from any one kind of stock. In case not more than three rings are reported, three classes or kinds of stock shall be included.

4. The selection of the judges and the supervision of the contest shall be under the direct charge and management of the Director of the Experiment Station, or Dean, and the head of the Animal Husbandry Department in each state.

5. The awards shall be made by a committee of three, one of whom shall be an agricultural newspaper man, and one an agricultural college man, the selections to be made by the Director of the Experiment Station, or Dean, and the head of the Animal Husbandry Department.

6. The reports must all be in the hands of the awarding committee not later than one week from the close of the fair, and the name of the successful contestant in each state and a copy of his report shall be forwarded to the Zenner Disinfectant Company, of Detroit, Michigan, within three weeks of the close of the fair.

International Live Stock Exposition.

The first week of December will be a "gala" week for those engaged in the live stock industry on this continent. The Second International Live Stock Exposition to be held at Union Stock Yards, Chicago, Ill., during that week will be larger in all of its departments than last year. The knowledge of a permanency to the Exposition inaugurated a year ago

led breeders to preparing for this Exposition who did not attend the initial Exposition. The range men and carload feeders of cattle and sheep are enthusiastic over the success of the first Exposition, and this part of the second International will probably be trebled in its proportions. Owing to the excessive demand for swine at the present time, the hog raisers as well as the hog breeders, intend to make their part of the International creditable in every way. It is needless to say that the horse exhibit will be grand, as it certainly was a most remarkable feature in the first Exposition. Creditable information develops that corporations and men of wealth are scouring foreign countries, as well as home, in search of prize winners. The colleges are all at work, and the rivalry, while thoroughly friendly, will be very intense, both in their exhibits and the student contests. The unsuccessful of last year have their armor on, and are industriously working to wrest the laurels from those who now hold them, while the winners of last year are fortifying themselves to retain their standards.

The arrangement of the Exposition will be much more compact than a year ago, as the Union Stock Yards Company is sparing no expense in constructing proper and adequate facilities. The erection of an enormous cattle amphitheater of brick and steel, with the buildings of last year enlarged, an increase in pen and walking capacity, will insure the possibility of handling large exhibits and double the crowd of a year ago, which now seems likely to be the attendance of the 1901 Exposition.

The National Live Stock Association holding its convention in the city of Chicago at Studebaker Hall on the first four days of the Exposition, enables students to put in the morning hearing the speeches and papers of the foremost men in the industry, and in the afternoon see

the results of the breeder's art. The description bulletin of feeding and handling of stock will be more complete than last year, and accessible to all interested in the advancement of this great industry.

The following programme has been arranged:

Tuesday, Dec. 3—To be Foreign Consuls' day, on which day it is hoped to have the consuls representing all of the various countries, who office in Chicago and adjacent towns, visit the Exposition, and see the class of live stock produced in this country, so that they may be able to make a report thereon from observation to their home government.

Wednesday, Dec. 4—Will be Governor's day. To each of the governors of the cattle growing and cattle feeding states an invitation has been extended, and it is very pleasing and flattering to the management of the Exposition that so many of these executive officers of the different states in which live stock is a strong factor, take such a strong interest in the Exposition as evinced, and will be with us.

Thursday, Dec. 5—It is the intention to invite all Foreign Ministers and Ambassadors located at Washington to view the handiwork of American breeders, and thus give them an insight into the great live stock industry of this continent.

Friday, Dec. 6—Will be Live Stock Sanitary Commissioners and Live Stock Agents' day. While every day is for the great American people.

The Exposition of last year was a decided success, the people of the country at large large recognize the importance of this event, and the Second International Live Stock Exposition will be greater in every way than its predecessor.

The entry blanks for the second International Live Stock Exposition are ready for distribution.

If intending exhibitors of pure breeding, and fat stock, and horses, will make

application for them to W. E. Skinner, General Manager, International Live Stock Exposition, Union Stock Yards, Chicago, stating how many animals they desire to enter, and the class or breed, it will greatly expedite matters in the office, and they will receive their many entry blanks promptly. Carloads of live stock do not need to be entered until arrival at the Union Stock Yards, Chicago. Premium lists will be sent out with the entry blanks only on request.

The Opportunity in Agriculture.

BY PROFESSOR THOMAS F. HUNT,

At the Dedication of the Agricultural Building, University of Illinois,
May 21, 1901.

The history of education, for, in, and by agriculture is always a fascinating subject and it is difficult to resist its recital. Its history is no part of the theme for this afternoon, however, and, moreover, it has frequently been set forth at length by far more potent pens. If this address contains aught of history, it will be because of its bearing upon the present and the future.

The discussions of this subject forty or fifty years ago make it perfectly clear that the early agitators were concerned in education *for* agriculture rather than *in* agriculture or *by* agriculture. They were concerned in the education of all the industrial classes along lines which would make them the most effective "in the several pursuits and occupations of life" because they believed that the welfare of the State depended upon the education of the masses. This is, indeed, the only warrant for the taxation of the people for the personal benefit of the individual. We vote bread and meat only to the physically, mentally, or morally incompetent. We vote a free education in order to give every one a reasonable

opportunity to earn his bread and meat, because the welfare of the State demands it. This proposition is too well understood to need more than the merest statement. The magnificent series of buildings, which we are called upon to dedicate today, the most extensive in the world for the purposes for which they are intended, is evidence sufficient, if evidence were needed, that this proposition has lost none of its force in the nearly thirty-nine years that have elapsed since the Congress of the United States, amid the most terrific civil conflict, passed the epoch making bill which prepared the way for the Arts of Peace. I wish here to congratulate my alma mater and all its officers who have promoted this undertaking upon their splendid achievement and to thank the people of the great Empire State of Illinois who have so generously voted money, not only in their own interests but in the interest of mankind for all time to come.

The farmer's need of education is a theme which I delight to discuss. It is the proposition that if a man is going to be a farmer, he of all men should have a thorough school training. The operations of the banker, the merchant, the manufacturer, the lawyer, the public speaker even, teach them much that they need to know to be successful. They are taught to do by the doing. What does the spreading of manure teach a man concerning the chemistry of fertilizers? What does the planting and reaping of corn teach a man concerning the laws of plant-growing?

The ordinary operations of the farm do not teach the farmer the most important facts concerning his business. In order to get that information most necessary to his highest success the knowledge obtained from farming must be supplemented from some other source. The more you look at this question, the more avenues from which you approach it, the stronger it will appeal to you.

This proposition was defended from this platform nearly seventeen years ago, when the last act in securing a first degree from these profes— No, I forget. It was not these professors. It was only seventeen years ago,—only a few years ago, surely,—but what changes! Since then, many a platform has been occupied with moderate composure, but here is but a beardless boy, standing with sinking heart before his fellow students, and as he walks out and makes his bow to President Peabody, he casts a hurried glance down the row with that feeling of student reverence for his professors that should he live till he was three score and ten, he could not out live. But I have been dreaming. Let me look again. Morrow, Snyder, Crawford, Prentice, McMurtrie, Roos, Pickard, who said, "Miss Pierce; can you pierce that?" "No," flashed back instantly the reply, "But I can *pick hard* at it." These are no longer present. Some have already gone to a deserved rest. But have they all gone? Let me look again. No, a few remain. Dear men and true—men who have seen this great University grow from a tiny seedling into a sturdy and ever expanding oak—still hold honored positions and influence in the faculty and affectionate places in the hearts of the alumni. Great, indeed, have been the changes in seventeen years. Then there were less than four hundred students; now more than two thousand five hundred. Then the faculty consisted of twenty-eight persons; now the instructional force consists of two hundred and fifty-eight persons. Then there were buildings devoted to instructional purposes worth with equipment less than \$350,000; now they are valued at one and one-third million dollars. The total annual income from all sources was then less than \$100,000; now it is nearly half a million dollars, the climax being capped by the largest appropriation ever made

by a legislature at one time for an educational institution.

I beg your pardon, ladies and gentlemen, for having allowed my personal feelings towards the old student home to lead me thus from the subject. The farmer's need of education is not, however, to be the theme this afternoon.

A passing thought can not be resisted concerning that ancient argument in favor of the farm, viz., that the farm has been the source of presidents, statesmen, diplomats, eminent lawyers, doctors, ministers, *ad finitum, ad nauseum*. The logic of this is that the farm is a good place to be born if you only get away soon enough. This argument says in effect that the farm is a valuable breeding ground to furnish strong, healthy, vigorous stock for the nation, the most able and the most intellectual of which are to be selected to supply the professions and manage the business interests of our cities, while the rest may go to the devil or become farmers. Apparently, in the minds of many, the two destinies are identical. I have no quarrel with this argument when it is stated frankly, but I submit it is not calculated to convince a young man that agriculture offers him an opportunity for a worthy career.

The thesis of this address is, Does agriculture (using the term in its broadest and proper sense) offer an opportunity worthy of an able, intellectual, ambitious young man? Can there be found therein a career worthy of an educated, broad-minded man?

Last year a young man graduated from the course in Agriculture. He happened to be unusually young. He was but twenty. Almost immediately upon graduation he was appointed to a cadetship at West Point through the courtesy of Senators Hanna and Foraker. He was an able, intellectual, cultured student of excellent spirit, manner and ad-

dress. He has had, as I believe, a thorough, sound education. He was such a young man as any home or college might be proud to send into the world. As it happened, he had during his college course been very much interested in the military drill, having occupied about every position in the battalion from private to adjutant, and had, in the absence of the commandant, during the Spanish-American war, charge of the battalion and taught military tactics. Suddenly he had two careers open to him. If he chose the one, the government would see to it that he suffered no real pecuniary need throughout his life time. His abilities are such as reasonably to assure promotion. He might even hope to occupy a position in the army second only to the President of the United States. If he chose the other career, and at that moment there was no immediate opportunity open to him, he must seek a career, where there was the ever present but ever unpleasant duty of providing bread and meat. He was up against (this is not slang) one of the great problems of life. He, of course, sought advice, but, I believe, he decided finally for himself. He does not lack in bravery, and I do not believe he had any special sentiment concerning the agricultural life. He had to decide between the art of war and the art of peace. He chose the art of peace. Did he choose wisely? It may be of some significance to note here that he subsequently entered the government service, but it was in the Department of Agriculture and not in the Department of War.

This, then, shall be the theme for a brief time this afternoon—Does the opportunity in Agriculture furnish a worthy career? I shall discuss it in two aspects, viz., the character of the education, which a course in agriculture offers and the opportunity for one so educated. Nor is the subject to be treated from the

agreeableness of the occupation. The beauty of sitting under your own vine and fig tree shall not enter into this discussion. No one will claim that the occupation of the President of the United States is a particularly pleasant one, but every man is ready and anxious to admit, if not by word at least by deed, that the position is worthy of the ambition of any American born citizen. Whether a man likes to wade around in the mud in the pure air rather than to walk on the carpet in the foul atmosphere (both literally and figuratively) of a criminal court room, is largely a matter of personal preference. It is a case of head vs. feet. I, each year, become more gratified that I did not choose the profession of law, because of my personal dislike for many of the circumstances surrounding a law practice, but that is not sufficient reason for others to avoid it, and every one must recognize that the practice of law offers to an ambitious, educated, high minded young man an opportunity for a worthy career.

When these institutions first offered themselves to the public as agricultural colleges, a few men in their faculties did a little teaching for agriculture, still less teaching in agriculture, and generally no teaching at all by agriculture. This is not strange. The few noble spirits, who kept alive the fires that burned so feebly during the first twenty years, and who essayed to teach the application of the sciences to agriculture, had not had, except in rare instances, any training in the sciences which they sought to apply, and, except in rare instances again, did the men who taught the sciences perceive their relation to agriculture and sometimes cared less.

Some exceptions, however, are worthy of note. The first experiment stations, established through the zeal and self-sacrifice of a small group of men, were the means of instructing and inspiring a

few young men, who have become the leaders of scientific thought as it relates to agriculture. These men may not have all been thoroughly practical men, but they were deeply trained in the sciences relating to agriculture. On the other hand, there were a few of our colleges that had the good fortune to secure as their co-called professor of agriculture, men of unusual vigor of mind, enthusiasm for the cause, and withal a wide knowledge of agriculture. In these institutions, a few young men have been trained, which, meeting with their more scientifically but less practically trained brethren, have together helped to control the destiny of this cause during the past twenty years.

It was not, however, until ten years ago, which happens to be coincidental with the passage of the second Morrill Act, that the teachers of what may be called technical agriculture were at all generally men who had been trained in the sciences underlying agriculture. These men, be it observed, had received their training in technical agriculture from men who had, themselves, for the most part, had no scientific training. What I would like to have the thoughtful young man see at this point is that most of the men, who have been trained in agriculture by those who have themselves had a college training in agriculture, have not been out of college more than five or six years and are, for the most part, less than thirty years of age. Boards of Trustees are remorseless and, perhaps, properly so, and men of my training will soon be no longer needed.

It is fully recognized that the professional field in agriculture is a distinctly limited one and it would, indeed, be a sad commentary upon the cause, if it was the only worthy field in agriculture open to a young man. But this much may be said that in the past ten years,

while I have been expecting to see this theoretically limited field supplied, the opportunities have constantly increased in number and improved in character. An illustration from a single State university having eighteen courses of study which lead to a degree, may be permitted. Twenty of its graduates during the last ten years are now in college positions other than their alma mater. Seven of these are from the course in agriculture. There has not been a year in the past five years that thoroughly trained and thoroughly able agriculturists have not been in demand for positions requiring the highest capabilities.

Teachers are the first necessity of a school of any kind, but only second to the necessity of teachers is the necessity for something to teach. The sciences have made great strides since 1870, especially the biological sciences. Chemistry had, indeed, a thoroughly established standing and the professor of natural science did the rest. However, mathematics and physics are not mechanics or engineering; physiology is not medicine; and chemistry is not agriculture, however fundamental these may be to the callings in question.

What did we know about dairying in 1870 that we now teach? Principally that cows would produce milk in the summer time if the pastures were good; that if we stirred some mysterious thing that came on the top of it, called cream, it would turn into butter; or if we added the juices of a calf's stomach to the milk, it would turn into cheese—all of which had been known for four thousand years. Dairying is now a specialized industry requiring a special education and training to succeed in it. Among men of business judgment none others need apply.

In an article on "Harvest Implements" in Morton's *Cyclopedia of Agriculture*, published in 1871, the writer states that "Notwithstanding all the ingenuity, how-

ever, that has hitherto been applied to this subject, reaping has been and no doubt for many years, as we have said, will continue to be a manual operation." The writer then proceeds to describe the various forms of sickles with which it is proper to cut grain. This article was not written by an ignoramus. Morton's *Cyclopedia of Agriculture* was as standard in the field of agriculture as the *Century Dictionary* is in the field of letters. It is true that America had known something of the reaping machines for fifteen years, but the self binder was yet a figment of the dreams of a few inventors. What this means may, perhaps, be best emphasized by the startling but nevertheless true statement that if the small grains of the crop of 1901 in the United States had to be reaped by the method so gravely described by our English authority, it would take the combined efforts of every man of military age in the United States three weeks to accomplish the task. This has an important bearing upon what is to follow. Here emphasis is laid upon the fact that rural engineering is a different problem from what it was thirty years ago.

Take an illustration from the field of animal industry that is just now for special reasons a very attractive line of work. In 1870, there were common in the United States one recognized breed of horses, three breeds of cattle, two or three breeds of swine, and, perhaps, five breeds of sheep. Some other breeds of live stock had been introduced, but they were practically unknown. At present, we have at least eleven recognized breeds of horses, not including ponies, seventeen breeds of cattle, eleven breeds of swine, and fourteen breeds of sheep, with all of which a man must be more or less familiar before he can lay any claim to being an expert in the field of animal industry.

In the field of applied sciences, the changes have been no less profound.

When the men who are now teaching the science of agriculture were in college, it was taught as a demonstrated scientific truth that mankind, in the no very distant future, must disappear from the face of the globe for lack of nitrogen in the soil. We know better now. So completely has this better knowledge been accepted and acted upon in agricultural operations that we have almost forgotten that we ever thought differently.

The year the speaker entered college, Professor Burrill discovered the cause of pear blight. Pear blight still continues on its way but how immensely has the horizon of our knowledge concerning plant and animal diseases widened. Not only have agricultural and horticultural operations been greatly modified, but the practice of human and veterinary medicine have been revolutionized, and with it all, the mind of the human race seems to have expanded; reason has taken the place of superstition.

The establishment in 1888 of experiment stations in each of the states has furnished a fountain from which is flowing knowledge recognized to be of the highest importance to agriculture. Knowledge which now has some semblance at least of scientific accuracy. Knowledge which is as accurate as can be expected when we consider the great difficulty of the subject. The effect of this progress of which but a hint has been given is that little that is taught today of technical agriculture was taught fifteen years ago.

It is necessary to remember that the old type of classical college required only a building of moderate dimensions, and, a department therein for equipment, a desk, a few chairs, a pointer, some chalk, and a number of erasers. Thirty years ago, the necessity of equipment for the teaching of the pure sciences was but little recognized. The necessity for a fairly equipped chemical laboratory was

indeed understood. A herbarium for the botanist, a few snakes and other specimens in alcohol for the zoologist, a number of cork-lined boxes for the entomologist, a small collection of minerals and stones for the geologist, a manikin and a few bones for the physiologist was about all that was thought necessary. When it came to the department of agriculture, a few samples of grain, mostly worm-eaten, a collection of patent office models, mostly of machines, which had never been used because of their visionary character, a few framed prints portraying animals of impossible conformation or in impossible attitudes, and a so-called model farm was considered the *sine qua non* for an equipment. A properly equipped farm is, indeed, a desirable adjunct to an ideally equipped college of agriculture, but other things were more essential. A farm, however, to serve the highest purpose of instruction to say nothing of experimentation cannot be made a model for a farmer to follow any more than a university machine shop can be made a model for a shoe factory.

Just as the teaching of the sciences has been found more expensive than the teaching of classics, so the teaching of the applied sciences has been found more expensive than the teaching of abstract science. And of all applied sciences, the teaching of agriculture has been found to be vastly the most expensive and it must, in the nature of the case, continue so. It is only during the past decade that the movement for the proper equipment of the colleges of agriculture has taken tangible form. The great state of Illinois has felt this movement and has come bravely to the front with the structures we are dedicating today, and with the equipment so soon promised will be second to none in the Union.

It may not be out of place here to inquire why agriculture has been slow in coming to its own. It is because of the

difficulty of the problems involved. The political economist has long ago divided people engaged in gainful occupations into four or five classes. Leaving aside the work of the serving class, the work of the world is divided into three classes, viz., changes in substance or natural products from which results agriculture and mining; changes of form, from which results manufacturing; and change of place, from which results trading and commerce. Did it ever occur to you that of all these great classes, agriculture alone deals with living things? Why has the cause of pear blight and the metabolism of nitrogen in the clover plant been so long hidden from the human understanding? It was first necessary to invent a high power microscope.

Like the water that flows to the sea, civilization has proceeded along lines of least resistance. The science of agriculture, dealing as it does with living things, has, because of the difficulty of understanding the processes of life, lagged behind those occupations depending for their best development upon a knowledge of the physical sciences. The science of agriculture will not reach its highest development until the problem of life has been solved. No man dare prophesy the heights which it may yet attain.

The study of agriculture, therefore, presents problems worthy of the most gifted and highly educated young man. A four-years' course in agriculture, or in any of its specialized branches, today gives a man not only a training *for* agriculture but *in* and *by* agriculture. It gives him such a professional training as to fit him as a bread winner of the highest type. When he has finished, he is fitted to do something somebody wants done. He has not only received a theoretical knowledge of the laws of nature, but such a practical knowledge of their application that he can successfully

use them on the farm, in the dairy, in the orchard, or in the garden. Not only are the hand and the eye trained, but through the hand and eye the mind is trained. In other words, the course in agriculture offers a sound education. Its graduates are not only educated farmers, but educated men.

I am not ready to assert that the mental drill received from instruction by technical agriculture, as at present taught, is equal to that received by the study of Greek, Latin, or Calculus. It is freely recognized that the colleges of agriculture have large opportunities in this regard. The men who are teaching these subjects have had literally to dig their subject out of the ground and have, in some cases, been so absorbed in acquiring knowledge that they have neglected the pedagogic methods of imparting it. But I am ready to assert that the young men who are now being graduated from the courses in agriculture are, let the reasons be what they may, the peers of the graduates of any of the courses of our land grant colleges and their subsequent work is showing them to be such.

I am conscious that I have used a great deal of time in order to say to the young man, that if you want a sound education, if you want an education that will fit you for a useful life, if you want an education worthy of the mental capacity of an Edison or a Pasteur, you can find it in a course of agriculture. If it will not serve your purpose in after life, do not take it. There are plenty of other courses that will give you as good a training. The variety of courses in the state universities is such as to suit the most fastidious. But if you are interested in the problems underlying agriculture, if your artistic instinct leads you to prefer producing, living, pulsating models of plants and animals, instead of reproducing their counterfeit on canvas, if your

scientific bent is towards organic rather than metallurgic chemistry, for botany rather than physics, if your business ability lies in trading in stock rather than in trading in stocks, if your love for excitement is better satisfied in the show ring than in the court room, you need not avoid a course in agriculture, because it lacks a training worthy of the highest mind. The Dean of your General Faculty years ago said that the digestive juice of education is interest. The fact that almost without exception those who have studied agriculture have been interested, not to say enthusiastic, has, in no small measure, added to their success.

But granting all this, after the education is acquired, will it produce bread and meat, and if so, is it sordid? Does it present an opportunity for a career, or will the possessors remain hewers of wood and drawers of water?

This is just as good a place as any to belhead once more that hydra-headed monster, which asserts that agricultural colleges educate boys away from the farm. I happen to have the statistics concerning the alumni of a college of agriculture and of its ex-students since 1892. These statistics concern 399 young men who have spent more or less time in studying agriculture. The occupation of 60 is unknown. One hundred and seventy-four are farmers, gardeners, and dairymen; 48 are creamery operators, butter, and cheesemakers; 8 are farm superintendents or employees, 28 are employees of colleges or stations or of the United States Department of Agriculture, 3 are editors of agricultural newspapers, and 19 are students in other colleges. The total number in all other occupations is 59. Of the 320 men who have settled occupation, 261 or 82 per cent., are engaged in agricultural pursuits. I am repeating no set phrase, when I say that those who have become

farmers are not only generally succeeding from a pecuniary standpoint, but they are becoming leaders in the intellectual, social, and political life of their respective communities. While a course in agriculture is not to be recommended as a means of political prosperity, yet it is probably quite within the truth to say that there is no surer road to political leadership even than success upon the farm by capable, broad-minded, well-educated men. Three of the farmers in the last Illinois legislature were trained in agriculture at the University of Illinois and their alma mater has had no reason to be ashamed of them.

Particularly is success coming to those who have completed a four-year course. Many young men have taken a one or two-year course in agriculture and in some institutions a winter term course, and they have gone to farming and have had a fair measure of success depending much, of course, upon their previous training. Many earnest and successful men have been trained in this way. There is, however, no greater error than to believe that if a man is going to farm a one or two-years' course is sufficient, while if he is going to be a teacher or an experimenter, he must have a thorough undergraduate and post-graduate training. Farming, in its several branches, is no exception to the rule that the greater the ability, the greater the success. Neither is there any question that many lines of farming now offer opportunities for the talented. The fact is that a training cannot be too severe for the man who intends to farm. No man needs a rigid training more; in no occupation may such training be made to count for more. A young man to be perfectly safe of success upon the farm should take a thorough under-graduate study, a year's post-graduate work, and then he should spend about three years as superintendent of a farm for some one else, or as a

professor of agriculture in some land grant college. He, then, becomes a trained agriculturist, worth a respectable compensation whether in business for himself or on salary for others. What engineer, what lawyer, what doctor, or what professor of literature or art considers himself able to win success in his calling without an equal training? I tell you, ladies and gentlemen, that if the farms of the United States do not furnish worthy opportunities for men thus trained, the cause of agricultural education is well nigh hopeless. I am equally convinced that the farms of the United States do furnish such opportunities. By no means all the five million farms of the United States, but a large enough per cent. of them to furnish opportunities for all the graduates that the colleges are likely to send out in the next twenty-five years.

Men of capital and business judgment are beginning to appreciate that the farms of this nation are distinctly limited and their money is being rapidly invested therein. Already those who have to do with such things are finding that there is a demand for persons to make the capital thus invested productive.

It is by no means asserted that a man must be college bred to be a man of ability or a superiorly trained agriculturist. Such a claim would be both untrue and foolish. It is claimed, however, that a college training is more necessary to a thorough knowledge of his business than to a merchant, a banker, or a manufacturer. It is asserted, moreover, that a college training is a short road to success. If you are in Chicago and want to get to New York, you may take a train or you may walk. Under present economic and social conditions, you had better take the modern method even if you have to borrow the money. As a final word on this phase of the subject, let me say if you cannot afford to pre-

pare yourself to be a farmer, do not farm. Enter some other business where the business itself will teach you success. Far better be a corner grocer or a street car conductor.

As already suggested, numerous opportunities are now open to trained agriculturists aside from the business of farming. Of the 320 young men mentioned a moment ago, thirty-six have graduated from the four-year courses of the college of agriculture during the past six years. Seventeen are on salaries within their proper professional field. The average length of time that they have been out of college is about two and one-half years and their average compensation will be this year about one thousand dollars. The illustrations given are from a single institution and the particular examples are used because the information is at hand.

The United States Department of Agriculture at Washington is also a good illustration of opportunities open to graduates of agricultural colleges, both in the way of positions and further training—the latter quite as important as the former. Within the present fiscal year twenty-two college graduates have been appointed in a single division of this Department at salaries ranging from \$480 to \$1,200. As indicative of the rapidity of promotion, it is stated that ten recent graduates, who entered the Department last year and this year at \$480 per annum are soon to be advanced to \$1000, while within the year an equal number of similar promotions will follow. Another Division, it is authoritatively stated, will need the coming year fifteen to twenty young men, preferably graduates of agricultural colleges. The Department of Agriculture at Washington is rapidly becoming a great post-graduate school of Agriculture with scholarships and opportunities for rapid promotion. The Department has just sent graduates of agri-

cultural colleges thus trained to Hawaii and Porto Rico to take charge of experiment stations there at a salary of \$3,000 each, one of whom, Frank D. Gardner, was of the class of 1891 of the University of Illinois.

After all, however, past and even present opportunities are important only as they indicate the future. The important question to a young man choosing a career is not so much what is the present opportunity, but what are the future prospects. Not how well will he begin his career, but how well will he end it. The average expectancy of a man who has reached the age of twenty-one is forty-one and one-half years. The question in preparing for the work of life is not alone, therefore, what is the opportunity today or what will it be four years hence when the young man has completed a course in college, but what is it going to be during the next forty years.

For 250 years we have called ourselves an agricultural people. While it is certainly true that we have been and still are, though in less degree, an agricultural people, our chief problems have not been those of the agriculturist. They have been chiefly the problems of the engineer. We have, it is true, made some real progress in the science of living things. Our animal and vegetable forms have been improved and thereby has the vigor and healthfulness of the human race been increased. I would, in no way minimize the importance of this improvement, but, after all, it has never become a serious question. Much of this improvement has been unconscious and much of it has been done by people who found pleasure in doing it. The large problems that have required serious thought have been the mechanical means of subduing nature, of planting, harvesting, manufacturing, and marketing the crop. At no time in its history scarcely has the nation suffered for food, clothing,

and shelter. At no time have these things been more abundant than in the past generation. Nature has been so prodigal that the surplus to the producer has been enormous provided only that the mechanical means could be obtained to handle her bounty. Harvesting machinery, including the cotton gin, and steam transportation have not only unlocked nature's wealth, but so cheapened the cost of production as to allow a large part of the population to busy itself with other matters of the highest importance to the present and future welfare of the race. Only during the present generation have we known two of the greatest of these agencies, viz., the self binder and the transcontinental railways. The result has been that we of the present generation have enjoyed comforts and luxuries beyond the fondest dreams of former generations. At no time has our prosperity been greater apparently than at the present moment. However, ungracious as it may seem to say it, it is to be feared that we have been so busy talking about our prosperity that we may not have noticed the slight quiver that precedes an earthquake.

It has recently been my privilege to discuss at some length the outlook for agriculture in this country, and were there time such an array of facts and figures could be presented as to be, I believe, both convincing and impressive. Two hundred and fifty years ago, the Puritans started in to subdue a continent. "By 1800 the United States nowhere touched the Gulf of Mexico, and nowhere crossed the Mississippi," much less had our agriculture and our civilization reached these limits. By 1850, we had acquired our present continental territorial limits, Alaska excepted, but the great west and northwest was agriculturally yet an undiscovered country.

In 1875, Central Iowa, at present one of the finest agricultural areas in the

world, was a wilderness. Since that time we have swept the continent with our agricultural operations. We have rolled up against the Pacific coast with such force that the shock has sent us thousands of miles across the sea.

The elements that have entered into the problem have been a great fertile, treeless, and easily subdued plain, in a climate admirably adapted to cereal production, one of which, maize, produces twice the food per acre of any cereal known to the civilized nations before the discovery of America; improved machinery, including the steel plow, the mower, the self binder, and the thresher; transcontinental steam transportation; and a people of high intelligence and great energy.

Do all the elements in the problem still exist? Let us look a moment. The animals upon the farms and ranches of the United States increased with such rapidity between 1875 and 1892 that in the latter year we had not only the largest number of animals, but much the largest number in proportion to population we have had in forty years.

Now look at the other side of the shield. Since that time the animals upon the farms and ranches of the United States have decreased with such almost lightning rapidity that in 1900, eight years later, we had not only less but much less live stock in proportion to population than we have had at any time in forty years.

The increase in acreage of cultivated crops between 1870 and 1890 was likewise greater than the increase in population. The increase in acreage of cultivated crops in the past thirty years is greater than was the total acreage in 1870. In other words, we have subdued more of nature to the uses of man since 1870 than we had been able to do in the two centuries of our history hitherto. In the last thirty years, we have doubled our

population and we have more than doubled the area of our cultivated crops. Shall we be producing two blades of grass in the place of one that grows today when the population has again doubled? Or will our inability to produce the two blades prevent population from doubling?

It is not here asserted that the two blades of grass will be produced. I believe, however, it is possible to do so, but if it is to be done, it must be done in a vastly different way than it has been done in the past thirty years. The problem will be vastly different. The problems will be solved by those who have studied organic chemistry and the sciences relating to life rather than by those who have studied mathematics and the laws of physics. In short the problems of the future will be the problems of the agriculturist rather than, as in the past, the problems of the engineers. The great engineering professions need no defense from me and I will certainly not be misunderstood by this comparison as minimizing their importance or that of any other form of useful knowledge to the welfare of future generations.

Is there any immediate evidence that the cultivated area may fail to keep up with the increasing population? The evidence is found in the statistics of the Department of Agriculture at Washington. The cultivated area has not actually decreased as has the number of farm animals, but the area has decreased in proportion to population about ten per cent. since 1890 and is now less in proportion to population than it has been at any time in twenty years.

But how can this be? Regard for a moment our unparalleled prosperity. If this is the effect of a decrease in acreage, by all means let us have some more decrease. The reply is simply that the seasons have been propitious. Not since the last half of the decade of the seventies

has this country had such yields per acre as during the years 1895-99. In no other five years since has the farmer received such large returns in *crops* for labor expended. A single illustration will indicate what this really means. The average yield of corn per acre for the five years, 1895-99 inclusive, was 3.2 bushels more than for the five years just preceeding that period. This is an increase of 14 per cent. This means an annual increase of two hundred and fifty million bushels of corn from the same acreage—if used in place of wheat more than half enough to bread the nation. All the golden metal mined in the same period in the United States would not begin to buy today merely the increase in this golden grain—the gift of prodigal nature.

It would be indeed pleasing in this connection to relate that this increase in yield had resulted from the investigations of our experiment stations and the teachings of our agricultural colleges. To make such a statement would be to make the wish father of the thought. Doubtless such agencies may have modified slightly and, when the teachings of the stations are put into general practice, will largely affect the result, but as surely as the rains fall and the frosts come we may expect a series of unpropitious seasons. Some fine morning we will wake up to find the scare lead of our "No breakfast is complete without it" newspaper have been changed and that accounts for wars and industrial combinations have been relegated to the second page.

It is well known to scientists that the existence of all animal life and hence of the human race upon the globe is dependent upon the fixation of carbon through the influence of the sun's rays. It is also well understood that the nation's material prosperity is due to those mechanical inventions that have made available to recent generations the stored up fertility of the soil and the stored up carbon in coal, oil and gas. How the conquest of Asia, Africa, and South America may affect the world at large no one can with certainty predict, but it seems reasonably certain that so far as the United States is concerned trapping carbon or bottling sunshine is to be a

much greater problem than it has been in the past.

Does this mean that famine stares us in the face? Does the fate of Egypt, Greece, and Rome await us? Such an inference is by no means necessary. I am no pessimist. The human race has solved its problems as it has come to them with varying degrees of success, but generally for the better. During the past two hundred and fifty years, this nation has solved some of the greatest problems of the race. The nation has greater problems to solve than it has yet encountered, but it was never before so well able to solve them. We need have no hesitation about our posterity. In all probabilities they will attend to their affairs better than we have attended to ours. All that is here asserted is that during the coming generations, men will be needed who have delved deeply into the sciences relating to life. The problem will not be so much the methods of harvesting, manufacturing, and marketing the one blade that now grows, but rather what are the life processes by which two blades may be made to grow. To the men who have prepared themselves to solve these problems of life will come the opportunities of the future.

It is curious to note how unconsciously conscious the nation is concerning this matter. In the very years when its soil was yielding her harvests most abundantly, Congress passed laws which have started the most stupendous enterprise for scientific research relating to the life and welfare of the nation that the world has ever seen. The federal government this year appropriated for the work of its Department of Agriculture, including the state experiment stations, over four and one-half million dollars, to say nothing of the provision that is made for teaching or that is made by the several states to the same objects. Even before there has come an apparently pressing demand for it, the nation is deep into the work.

This, then, is the message which I bring to the young men of today—the nation's workers of tomorrow. The Colleges of Agriculture are teaching the sciences relating to life in a practical manner, so that one may become useful both to himself and to mankind. It is an education *for* agriculture, *in* agriculture, and

by agriculture. It is a sound education worthy of the deepest intellect. The present and the future demand men prepared to solve the greatest of problems—the problems which concern living things. Who knows why clay soils are sticky, and sandy soils are not? Who can answer this fundamental fact with which the farmer is daily associated? Why cannot a stalk of Indian corn be successfully matured in a pot? Whoever answers this, answer some of the fundamental but still unknown questions concerning plant growth. One acre in every three that is plowed in the United States is planted to Indian corn. If all the pig iron mined in the United States had been made into steel rails in the record-breaking year of 1899, they would not have purchased the corn crop ~~the~~ same year. Yet each year one-fifth of this great crop is lost in the curing. He who gives the reasons and applies the remedy, will acquire fame and the gratitude of his fellowmen. Neither may the value be placed upon the results which may come from him who changes the chemical composition of this beneficent grain. Of two cows treated exactly alike as far as human endeavor is concerned, one will produce 300 pounds of butter and the other 150 pounds. He who solves this mystery will solve the mystery of the mysteries.

Notwithstanding the improvement in labor-saving machinery, the greatest endeavor of the human race is still to produce food. If a penny saved is a penny earned, what shall we say of him who makes the potential energy of this vast force more available. Three centuries ago, the yield of wheat in England is said to have been not more than six bushels per acre. The same soil is rained upon by the same rains and sunned by the same sun, yet today the yield is thirty bushels. Who in this country will point the way to sixty bushels of wheat instead of twelve or one hundred bushels of corn instead of twenty-five?

The problems are unlimited, but the greatest of them are yet beyond the vision of man. To him who has prepared himself to solve these life problems, will come the opportunities of the future. The world waits for him. Its rewards will not be meagre.

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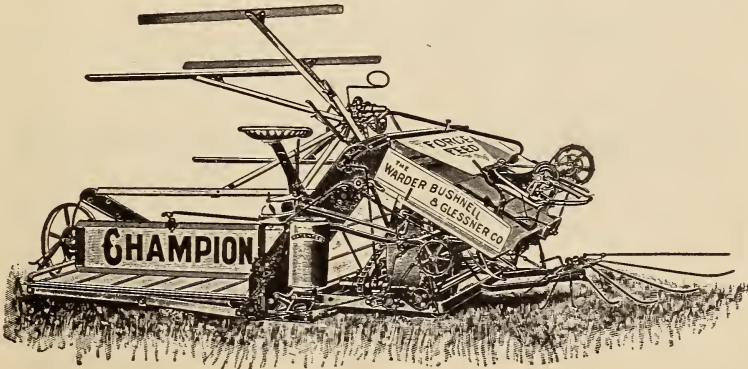
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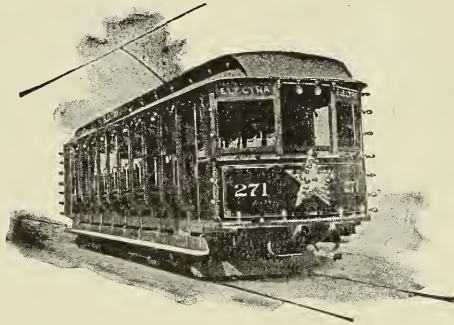
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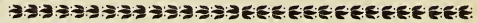
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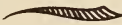
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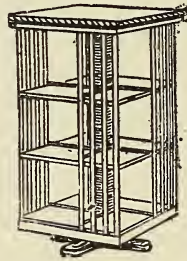


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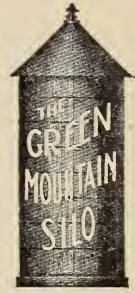
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